PARALOID™ K-SERIES Processing Aids

Description

PARALOID™ K-series are methyl methacrylate type processing aids for PVC used mainly in building applications, such as window frames, panels, siding, fences, sign boards, roofing sheets, pipes, fittings, injection-molded parts and foamed products.

PARALOID K-series processing aids offer the following benefits over competitive products for PVC:

- Enhance faster fusion at lower processing temperature.
- Improve cohesion of melt and its homogeneity.
- Improve melt strength, extensibility and elasticity.
- Prevent melt fracture, improve smoother product surface and quality.
- Well disperse in PVC matrix.
- Enhance products with higher surface gloss.
- Lower foam density.
- Uniform cell structure.

Product Range and Application

<table>
<thead>
<tr>
<th>Product</th>
<th>Promote Fusion</th>
<th>Melt Strength</th>
<th>Metal Release</th>
<th>Dispersion</th>
<th>Die Swell</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Window Profile</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Rigid</td>
</tr>
<tr>
<td>K-175P</td>
<td>*</td>
<td>*</td>
<td>*****</td>
<td>*****</td>
<td>**</td>
<td>●</td>
</tr>
<tr>
<td>K-125P</td>
<td>****</td>
<td>****</td>
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<td>****</td>
<td>****</td>
<td>●</td>
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<tr>
<td>K-400P</td>
<td>*****</td>
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<td>***</td>
<td>****</td>
<td>****</td>
<td>●</td>
</tr>
</tbody>
</table>

Note: more "***" means better

Relationship between Melt Strength and Molecular Weight

Promote Fusion

PARALOID K-series processing aids promote and homogenize PVC fusion drastically. Below graphs clearly indicate its fusion efficiency.
Physical Properties

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Unit</th>
<th>Specification Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Volatiles Content</td>
<td>%</td>
<td>Max. 1.0</td>
</tr>
<tr>
<td>2</td>
<td>Particle Size Distribution</td>
<td>%</td>
<td>Max. 1.0</td>
</tr>
<tr>
<td></td>
<td>&gt; 850 micron</td>
<td></td>
<td>Max. 15.0</td>
</tr>
<tr>
<td></td>
<td>&lt; 45 micron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bulk Density</td>
<td>g/cm³</td>
<td>0.25<del>0.45 K175P (0.35</del>0.55)</td>
</tr>
</tbody>
</table>

Recommended Formulation

**PVC Window Profile Formulation One**
- Tin Stabilizer
- PVC (K-65~68): 100
- Carstab TH-811: 0.9~1.5
- PARALOID™ KM Product: 4.5~6.5
- PARALOID K125P: 0.5~1.5
- PARALOID K175P: 0.5~1.0
- Calcium Stearate: 1.0~1.5
- Paraffin Wax: 0.4~1.0
- OPE Wax: 0.1~0.3
- Titanium Dioxide: 4.0~10.0
- Calcium Carbonate: 5.0~12.0

**PVC Window Profile Formulation Two**
- Lead Stabilizer
- PVC (K-65~68): 100
- ADVASTAB™ TM-950F: 1.7~2.0
- PARALOID™ K400P: 7.0~10.0
- PARALOID K175P: 1.0~2.0
- Calcium Stearate: 0.6~1.2
- Paraffin Wax: 0.5~1.0
- OPE Wax: 0.1~0.2
- Titanium Dioxide: 0.5~2.0
- Sodium Bicarbonate: 1.0~1.5
- Azodicarbonamide: 0.2~0.5
- Titanium Dioxide: 1.0~5.0
- Calcium Carbonate: 3.0~5.0

**PVC Foam Sheet & Profile Formulation**
- PVC (K-57~60): 100
- ADVASTAB™ TM-950F: 1.7~2.0
- PARALOID™ K400P: 7.0~10.0
- PARALOID K175P: 1.0~2.0
- Calcium Stearate: 0.6~1.2
- Paraffin Wax: 0.5~1.0
- OPE Wax: 0.1~0.2
- Sodium Bicarbonate: 1.0~1.5
- Azodicarbonamide: 0.2~0.5
- Titanium Dioxide: 1.0~5.0
- Calcium Carbonate: 3.0~5.0

**PVC Pipe Formulation**
- PVC (K-65~68): 100
- ADVASTAB™ TM-291: 0.4~0.6
- PARALOID K125P: 0.7~1.0
- Calcium Stearate: 0.6~1.0
- Paraffin Wax: 1.0~2.0
- OPE Wax: 0.1~0.2
- Titanium Dioxide: 0.5~2.0
- Sodium Bicarbonate: 3.0~5.0
- Azodicarbonamide: 0.2~0.5
- Titanium Dioxide: 1.0~5.0
- Calcium Carbonate: 3.0~5.0
Safe Handling Recommendations

PARALOID™ plastic additives should be kept away from flames, hot pipes, heaters or other sources of heat. Adequate precautions should be taken to keep all dust levels below values that are hazardous to health and safety. In the case of eye or skin contact, eyes should be flushed with water to remove dust particles and affected skin areas washed with soap and water.

Dow Plastics Additives

The Dow Chemical Company is a worldwide supplier of plastic additives used in a large variety of applications for vinyl, polyester, polycarbonate, and other engineering plastics or blends. Automotives parts, business machines, construction materials, packaging, home appliances, and consumer electronics owe their properties to these invisible workhorses, which add impact strength, clarity, chemical resistance, heat resistance, heat stability, weather resistance, color retention, greater output rates, melt strength and lubrication to base polymers.

For more than 50 years, The Dow Chemical Company has been a pioneer in the development of plastic additives, introducing in 1956 the first MBS impact modifier, followed two years later by the first processing aid and in 1968 by the first all-acrylic impact modifier.

Performance Provider Product Series

<table>
<thead>
<tr>
<th>Product Series</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACRYLIGARD™</td>
<td>Acrylic Capstock Resin</td>
</tr>
<tr>
<td>ADVVALUE™</td>
<td>Specialty Lubricant</td>
</tr>
<tr>
<td>ADVAWAX™</td>
<td>Specialty Wax</td>
</tr>
<tr>
<td>ADVASTAB</td>
<td>Methyl Tin Heat Stabilizer</td>
</tr>
<tr>
<td>ADVAPAK™</td>
<td>Multiple-function Methyl Tin Heat Stabilizer</td>
</tr>
<tr>
<td>PARALOID™</td>
<td>Impact Modifiers and Processing Aids</td>
</tr>
<tr>
<td>PARALOID EXL™</td>
<td>Additives for Engineering Resins</td>
</tr>
</tbody>
</table>

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